CLAIMS

What we claim is:

1. A peptide fingerprint comprising peptide products resulting from the degradation of elastin by the enzyme MMP12, wherein the peptide fingerprint comprises one or more of the peptides identified in Table 2.

2. A peptide fingerprint as claimed in claim 1 which comprises at least twenty of the peptides identified in Table 2.

3. A peptide fingerprint as claimed in claim 1 which comprises at least ninety of the peptides identified in Table 2.

4. A peptide fingerprint as claimed in claim 1 which comprises at least one hundred and fifty of the peptides identified in Table 2.

5. A peptide fingerprint as claimed in claim 1 which comprises all the peptides identified in Table 1.

6. A peptide fingerprint as claimed in claim 1 which comprises all the peptides identified in Table 2.

7. A method to determine if or confirm that the enzyme MMP12 is associated with disease Y which comprises:

   (a) obtaining a healthy biofluid sample or a healthy tissue sample;
   (b) analysing the healthy sample to produce a healthy peptide fingerprint;
   (c) obtaining a diseased biofluid sample or a diseased tissue sample, wherein the diseased sample shows signs of the onset or progression of disease Y;
   (d) analysing the diseased sample to produce a diseased peptide fingerprint;
   (e) comparing the healthy peptide fingerprint to the diseased peptide fingerprint and identifying the set of peptides found in the diseased peptide fingerprint;

(f) comparing the diseased set of peptides identified in step (e) with a peptide fingerprint comprising peptide products resulting from the degradation of elastin by the enzyme MMP12, wherein the peptide fingerprint comprises one or more of the peptides identified in Table 2, and determining if there are statistically significant similarities or differences between them based upon qualitative and quantitative comparison using statistical formulations testing chance occurrence;

(g) if significant associations between the quantitative and qualitative parameters of measurement are determined in step (f), concluding that the enzyme MMP12 is associated with disease Y in the sample analysed;

(h) if no significant associations between the quantitative and qualitative parameters of measurement are determined in step (f), concluding that the enzyme MMP12 is not associated with disease Y in the sample analysed.

8. A method as claimed in claim 7 wherein disease Y is COPD.

9. A method to determine the presence of a clinical condition known as disease Y which comprises:

(a) obtaining a biofluid sample or a tissue sample;

(b) analysing the sample to obtain its peptide fingerprint;

(c) comparing the peptide fingerprint of the sample identified in step (b) with a peptide fingerprint comprising peptide products resulting from the degradation of elastin by the enzyme MMP12, wherein the peptide fingerprint comprises one or more of the peptides identified in Table 2, and determining if there are statistically significant similarities between them;

(d) if statistically significant similarities are determined in step (c), concluding that the clinical condition known as disease Y is present;

(e) if no statistically significant similarities are determined in step (c), concluding that the clinical condition known as disease Y is absent or is being successfully treated.

10. A method as claimed in claim 9 wherein disease Y is COPD.

11. A diagnostic test kit for determining the presence of a disease Y which comprises means to compare the peptide fingerprint of a biofluid sample or the peptide fingerprint of a tissue sample with a substrate fingerprint comprising peptide products resulting from the degradation of elastin by the enzyme MMP12, wherein the substrate fingerprint comprises one or more of the peptides identified in Table 2.

12. A diagnostic test kit as claimed in claim 11 wherein disease Y is COPD.

13. A method to analyse the effect of a drug Z on the enzyme MMP12 which comprises:
(a) treating a human or non-human animal with the drug Z, wherein the human or non-human animal is suffering from disease Y;
(b) obtaining a biofluid sample or a tissue sample from the human or non-human animal;
(c) analysing the sample to obtain its peptide fingerprint;
(d) comparing the peptide fingerprint of the sample identified in step (c) with a peptide fingerprint comprising peptide products resulting from the degradation of elastin by the enzyme MMP12, wherein the peptide fingerprint comprises one or more of the peptides identified in Table 2, and determining if there are statistically significant similarities between them;
(e) if statistically significant similarities are determined in step (d), concluding that drug Z is not inhibiting the enzyme MMP12;
(f) if no statistically significant similarities are determined in step (d), concluding that drug Z is inhibiting the enzyme MMP12.

14. A method as claimed in claim 13 wherein disease Y is COPD.

15. A diagnostic test kit for analysing the effect of a drug Z on the enzyme MMP12 which comprises means to compare the peptide fingerprint of a biofluid sample or the peptide fingerprint of a tissue sample with a substrate fingerprint comprising peptide products resulting from the degradation of elastin by the enzyme MMP12, wherein the substrate fingerprint comprises one or more of the peptides identified in Table 2 and wherein the sample has been obtained from a human or non-human animal that has been or is being treated with the drug Z.